

English translation of the amendments as annexed to the International Preliminary Examination Report of the International Patent Application No. PCT/CH2002/000582 "Intervertebral disk prosthesis or artificial vertebra" in the

5 name of Mathys Medizinaltechnik AG

**Patent claims**

1. An intervertebral disk prosthesis or an artificial vertebral body with
  - 10 A) an essentially hollow-cylindrical basic body (1) with a jacket (2) constructed as a bellows, a top end (3), a bottom end (4) and a central longitudinal axis (5),
  - B) a top apposition plate (6), provided transversely to the longitudinal axis (5) on the top end (3) of the basic body (1), that is intended as a support for the
  - 15 base plate of a vertebral body, and
  - C) a bottom apposition plate (7), provided transversely to the longitudinal axis (5) on the bottom end (4) of the basic body 1, that can be placed on the cover plate of a vertebral body, and
  - D) the jacket (2), constructed as a bellows, is constructed as a spring element
  - 20 with a specific spring rate.
- characterised in that
- E) the jacket (2) comprises a plurality of bellows inserted into one another.
2. An intervertebral disk prosthesis or an artificial vertebral body according to
  - 25 claim 1, characterised in that the specific spring rate is minimum 50 N/mm, preferably minimum 100 N/mm.
3. An intervertebral disk prosthesis or an artificial vertebral body according to
  - claim 2, characterised in that the spring rate is minimum 150 N/mm, preferably
  - 30 minimum 400 N/mm.
4. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 3, characterised in that the spring rate is maximum 800 N/mm, preferably maximum 2000 N/mm.

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5. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 4, characterised in that under a load of 1000 N the spring travel of the spring element is in the range of 1-2 mm, preferably in the range 5 of 1.3-1.7 mm.

10 6. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 5, characterised in that the spring element is both a tensile spring and a compression spring.

15 7. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 6, characterised in that the number of folds of the jacket (2), constructed as a bellows, is in the range of 3-10.

20 8. An intervertebral disk prosthesis or an artificial vertebral body according to claim 7, characterised in that the number of folds of the jacket (2), constructed as a bellows, is in the range of 4-5.

9. An intervertebral disk prosthesis or an artificial vertebral body according to any 20 one of claims 1 to 8, characterised in that the jacket (2) comprises a plurality of single layers.

25 10. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 9, characterised in that the single layers of the jacket (2) are spaced from one another.

11. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 9, characterised in that the single layers of the jacket (2) abut against one another without intermediate layers.

30 12. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 11, characterised in that the jacket has slots that extend basically parallel to the longitudinal axis (5).

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13. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 12, characterised in that the rotational stiffness of the jacket (2) allows a 1°-3° rotation of the jacket, preferably 1.5°-2.5°.

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14. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 13, characterised in that when an axial force of 800 N is applied, the axial stroke of the jacket is in the range of 1.0-2.5 mm, preferably in the range of 1.30-1.75 mm.

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15. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 14, characterised in that both apposition plates (6, 7) are fastened on the top and bottom ends (3, 4) of the basic body (1) axially firmly but enabling rotation.

16. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 15, characterised in that both apposition plates (6, 7) are axially fastened on the top and bottom ends (3, 4) of the basic body (1) and their rotation about the longitudinal axis (5) is limited, preferably to an angular range of maximum 5°.

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17. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 15, characterised in that both apposition plates (6, 7) are fastened on the top and bottom ends (3, 4) of the basic body (1) axially firmly and unable to rotate.

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18. An intervertebral disk prosthesis or an artificial vertebral body according to claim 17, characterised in that the rotational stiffness of the jacket (2) constructed as bellows is so chosen, that both apposition plates (6, 7) can rotate relative one another about the longitudinal axis (5) by an angle of 1°-5°, preferably 2°-3°.

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19. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 18, characterised in that both apposition plates (6, 7) can be tilted from the plane that is orthogonal to the longitudinal axis (5) by an angle of 4°-8°, preferably 5°-7°.

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20. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 19, characterised in that the hollow-cylindrical basic body (1) is filled at least partially with a solid body, acting as a dampening element.

10 21. An intervertebral disk prosthesis or an artificial vertebral body according to claim 20, characterised in that the solid body is a synthetic material, 15 preferably an elastomer.

22. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 21, characterised in that the jacket (2) is made from a metal or a metal alloy, preferably based on titanium.

20 23. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 22, characterised in that the material of the jacket (2) has a minimum stretch limit of 30 %, preferably a minimum of 38 %.

25 24. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 21, characterised in that the jacket (2) is made from a synthetic material, preferably an elastomer.

30 25. An intervertebral disk prosthesis or an artificial vertebral body according to any one of claims 1 to 24, characterised in that the jacket (2) is made from a packet of cup springs.

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